USAID
FROM THE AMERICAN PEOPLE

LESSONS LEARNED

USAID/RWANDA POST HARVEST HANDLING AND STORAGE (PHHS) PROJECT



July 2012

This publication was produced for review by the United States Agency for International Development. It was prepared by Virginia Schippers, Nathan Van Dusen and Kristin Beyard of CARANA Corporation with the substantial technical guidance of Martin West and the PHHS project technical team.

LESSONS LEARNED

USAID/RWANDA POST HARVEST HANDLING AND STORAGE (PHHS) PROJECT

JULY 2012

CONTENTS

LIST OF ABBREVIATIONS

AFICCO	Agence de Fiscalité, Comptabilité et Courtage
BDS	Business Development Service
CHF	Cooperative Housing Foundation
GDP	Gross Domestic Product
GoR	Government of the Republic of Rwanda
KCB	Kenya Commercial Bank
MINAGRI	Ministry of Agriculture and Animal Resources
MIS	Market Information System
MLI	Market Linkages Initiative
P4P	Purchase for Progress
PHHS	Post-Harvest Handling & Storage
RGCC	Rwandan Grain and Cereals Corporation
ToT	Training of Trainer
USAID	United States Agency for International Development
WEACS	Wakala East Africa Consulting Services
WFP	World Food Program

1. BACKGROUND

Agriculture drives the Rwandan economy and accounts for 80% of employment, 36% of GDP, and 63% of foreign exchange earnings[1]. The agricultural sector has seen rapid growth in recent years with large increases in production achieved by smallholder farmers, 95% of whom have farms that are less than two hectares in size[2]. This fragmented production base leads to serious challenges in getting product to market efficiently and integrating farmers into commercial marketing channels that allow for differentiation. Among the impacts of fragmentation, MINAGRI estimates 20% post-harvest losses in cereals.[3] Losses impact producers and consumers, reducing farmer incomes as a result of low yields, and raising consumer prices as a result of diminished supply.

As part of the U.S. Global Food Security Response Initiative, USAID's Post-Harvest Handling and Storage Project (PHHS) has set out to integrate farmers into differentiated commercial marketing channels as a way of driving investment in post-harvest technology and process improvements for staple crops, particularly maize, beans, and rice. The PHHS project has sought to link cooperatives capable of aggregating enough product to fulfill commercial contracts with strategic buyers and then supported both co-op managers and members with technical assistance and grants to upgrade their post-harvest systems. This report looks at the lessons learned from the first 30 months of the PHHS project and provides recommendations for future interventions focused on integrating smallholder farmers into commercial markets.

Methodology & Objectives

Following the Project's Inception Report completed in April 2010, and in alignment with current MINAGRI policies, PHHS prioritized maize, beans, and rice with program interventions for these commodities as follows:

- Mobilizing private investment and bank finance to develop businesses that require storage infrastructure;
- Improving management and handling of staple crops by farmers, in partnership with agribusiness firms through a market-driven approach;
- Developing more robust linkages between farmers and the market by connecting producers to premium markets through intensive training by the Sell More for More Training team;
- Assisting farmer associations/cooperatives to expand their own warehouse infrastructure and working capital needs through business plan development and finance training courses to attract private bank finance;

---

[1] World Bank, *Project Appraisal Document on a Proposed Grant to the Republic of Rwanda for a Rwanda Second Rural Sector Support Project in the Second Phase of the Rural Sector Support Program*, World Bank, June 2008.

[2] Morel-Seytoux, Sylvie H. Lalonde. *Gender Assessment and Action Plan for USAID Rwanda*, WIDTech, Washington, District of Columbia, March 2002.

[3] Ragama, Philip, J.M. Vianney Nyabyenda, J.M. Vianney Gakwandi, D. Chizelema. *Crop Assessment Report – 2008 A Season*, MINAGRI, Republic of Rwanda, January 2008.

- Increasing MINAGRI's capacity to widen its medium-term strategy for the development of Rwandan staple crops through improved marketing and post-harvest activities; and

- Identifying specific market-led actions that can be taken by individual players within the value chain to reduce post-harvest losses in staple crops.

Initially, the PHHS project was expected to run from September 2009 to March 2012.

In March 2012, the project received a 15-month extension with additional funding to continue and expand upon its original activities; specifically, to improve smallholder farmer incomes and increase food security in Rwanda by reducing post-harvest losses.

The scope of work for the PHHS project (initial and extension phases) is comprised of four components:

1) **Market Linkages** with firms that will result in strategic partnerships to develop business ventures and invest in post harvest handling and storage;

2) **Investment Finance** that will result in strengthening supply and incomes through the availability of finance within the maize and bean value chains;

3) **Post-Harvest Management** that will lead to better handling practices for farmers seeking higher prices for better quality commodities; and

4) **Post-Harvest Policy** that will be recommended to the Government of Rwanda with the intent to improve the business environment for the private sector.

This paper examines lessons learned from September 2009 through March 2012 in order to inform the extension period activities as well as future USAID initiatives in Rwanda.

2. MARKET LINKAGES

The PHHS project has sought to mobilize resources to address post-harvest inefficiencies upstream in the supply chain, in part, by connecting smallholder farmers more directly to formal buyers. Theoretically, moving away from spot selling to itinerant traders should unlock value that is captured by intermediaries, freeing up resources for investment. More direct relationships with more formal buyers (usually through organized cooperatives) should serve also as a foundation for credit provision and improved market information, which can be leveraged into production of a higher quality product that can be sold at a premium price. The PHHS project approached the building of these relationships by acting as a facilitator to stimulate direct contracting with more sophisticated buyers (offering price premiums for a differentiated product).

Through this process, the PHHS project encountered three key factors that limit the ability of smallholder farmers and their cooperatives to sustainably build direct market linkages in Rwanda. First and foremost was the relatively small number of formal private sector actors operating in staple markets when compared to other countries in the region or to higher-value (particularly export-oriented) crops. Second was the role of the Rwandan government and its direct purchasing programs in the market, which often have unintended distortionary effects that undermine private buyers seeking to develop stronger suppliers. Third was the limited capacity of cooperatives to supply sufficient quantities at buyer specifications.

The PHHS project has sought to build more direct market linkages by serving as an honest broker and connecting cooperatives and buyers to opportunities on the demand and supply side. Below are some lessons learned that point to successful approaches that could be scaled up or replicated in the future.

Lesson Learned: *WFP can be a useful leverage point for transforming incentives and practices within the value chain*.

WFP's P4P program was an important alliance for PHHS, linking smallholder farmers to a premium market for better quality maize and beans. With a target purchasing power of around 20,000 metric tons per year, WFP and its partner trading companies offer a significant opportunity for cooperatives that seek a stable buyer for large quantities. Most importantly, WFP is willing to pay a premium for supplies that meet their standard, unlocking value at the cooperative level for improvements in post-harvest infrastructure.

WFP was an important leverage point for the PHHS project as it sought to generate a shift in the market toward product and price differentiation. WFP was willing to source from cooperatives benefiting from PHHS trainings and credit facilitation services, which may otherwise have been viewed as too risky or not economically viable for private sector buyers. The WFP contracts also acted as a catalyst for bank financing of cooperatives. In addition to securing a market, credit and higher prices for PHHS-trained cooperatives, the WFP provided training in warehouse management to the cooperatives that it sources from.

Perhaps most importantly, private sector buyers like ProDev/Minimex are following WFP's lead and starting to buy from reliable cooperatives that have supplied WFP in prior seasons, pushing WFP to move on to marginal suppliers.

Implication for Future Programs: WFP's relationship has been transformational for involved cooperatives. These cooperatives have improved their post-harvest infrastructure, gained access to credit and developed their capacity to supply a differentiated product that captures a premium in the marketplace. Involved cooperatives are purchasing at a fraction (~20%) of their target; the opportunity for scaling is significant. WFP does not necessarily have to play the role of market developer that it is playing in Rwanda. Arguably, this role is unsustainable, as WFP exists on the basis of donor country support.

Over the long-term, the role of market developer could be played by a consortium of private sector buyers, by the government's purchasing agents, or an alliance of both. The PHHS project has already started working with the Rwandan Grain and Cereal Corporation (RGCC), which is targeting 20,000-30,000MT per year, to evolve its purchase scheme to mirror the WFP model, offering premium prices for higher quality supplies.

Lesson Learned: *Policies can serve as a barrier to sustainable market linkages*.

The Project's work with bean buyers demonstrated that policy-driven incentives can frustrate private sector efforts to develop local supply chains. In working to connect buyers to bean cooperatives, the project found that the cooperatives were generally producing mixed varieties of beans, whereas buyers were seeking large quantities of singular varieties. Farmers in Rwanda produce mixed varieties to hedge against the risk of failure of any single crop, also because the government provides a market for mixed beans that reinforce this risk mitigation strategy.

The lesson learned here is that market linkages initiatives within markets that are distorted by policy-driven incentives need to be linked with complementary policy initiatives. If Government of Rwanda standards are aligned with private sector standards, it would be easier to work with cooperatives toward a supply response that meets this singular standard.

Implications for Future Programs: In a country like Rwanda, where the government plays a significant role in the end market for agricultural goods, it is critical that USAID programs account for this role and work with the government to align purchase programs with goals of long-term market development. This complement to private sector market linkages efforts will deepen the impact at the smallholder farmer level, improving the commercial viability of target crops.

Lesson Learned: *Cooperatives play an important role, and require capacity building to complement market linkages and MIS initiatives*.

Private sector buyers in Rwanda are eager to source locally if suppliers can fulfill larger contracts. Cooperatives offer a solution to this requirement when they can supply the infrastructure and level of service required to aggregate, clean, sort, grade and store product to buyer specifications. While the PHHS project has been successful in linking cooperatives to larger and more sophisticated buyers, these relationships have been made sustainable on the basis of complementary capacity building and financial facilitation provided by the PHHS project and its local partners.

Under the post-harvest management and investment finance components of the PHHS project, USAID is co-investing in village aggregation centers and post-harvesting equipment; providing training and technical assistance on post-harvest management; and piloting a merchandizing credit scheme that supports successful fulfillment of orders from larger buyers.

Implications for Future Programs: As the PHHS project seeks to develop a sustainable Business Development Center that will serve as a hub for buyer-supplier linkages and supports the evolution of the Esoko MIS platform, lessons learned related to the importance of building supplier/cooperative capacity to meet market requirements need to be taken into account. The PHHS project has actively sought to embed capacity-building activities in local institutions, working closely with MINAGRI and with local service providers such as WEACS. The long-term evolution of the agricultural market should lead to buyers and cooperatives contracting firms like WEACS to provide these services and to input and equipment suppliers providing related services to farmers and cooperatives that purchase from them.

Given the volume of government and donor spending on agriculture, however, the market for capacity-building services is not viable. In the interim, USAID programs should continue to lay the groundwork for the private service market by delivering capacity building through local service providers and working with government agencies like RGCC and MINAGRI to do the same. Over time, as donor and government subsidies phase out, this will ensure that a viable cadre of capacity-building service providers exists and that a growing network of cooperatives and buyers sees the value in securing their services to develop local supply chains for staple commodities. Elsewhere, CARANA Corporation has piloted initiatives focused on stimulating the growth of BDS markets and our experience has been that these are most successful when service providers work on a performance basis (usually based on a percentage of increased revenue or reduced cost attributable to the service provided). As donor and government programs phase out, they can encourage this shift in the business model that BDS providers are operating under.

3. INVESTMENT FINANCE

Underinvestment in storage infrastructure was identified in the design of the PHHS project as one of the most acute constraints to a more efficient and competitive agricultural sector in Rwanda. This was based on two assumptions: 1) post-harvest losses were high and 2) seasonal price variations resulted in low prices paid to farmers at harvest and high marketing margins for traders. However, an analysis of historical prices did not support the second assumption and it is suspected that initial estimates of post-harvest losses were high. This calls into question the value of focusing on construction of large storage units. Still, access to finance and investment is a critical requirement for market development, including the capacity of cooperatives to aggregate product and meet the requirements of premium buyers.

Financial institutions in Rwanda are reluctant to invest in the agriculture sector due to the perceived level of risk. Historically, banks in Rwanda have also engaged in traditional collateral-based lending that is difficult for farmers and cooperatives to access. Asset-based lending that is better adapted to the needs of the sector is relatively new. In this environment, it is difficult for cooperatives to mobilize capital for basic infrastructure and purchases of grain from their members.

The PHHS project has evolved its approach from an initial focus on leveraging investment in storage infrastructure to a focus on smaller-scale infrastructure for aggregation, shelling, cleaning, sorting and drying, complemented by credit for cooperatives to support purchase of surpluses from their members. Matching grants for basic infrastructure and merchandizing credit offerings are enabling cooperatives to successfully fulfill orders from buyers like the WFP and PRODEV/MINIMEX. The merchandizing credit product was developed via a partnership between the PHHS project and Kenya Commercial Bank (KCB), and allows cooperatives to borrow against pending orders to finance the purchase of grain from their members. This asset-based mechanism is new to agricultural lending in Rwanda and has shown promising results.

In spite of the project's efforts to date, levels of investment and lending to the agricultural sector in Rwanda remain low and will require further larger-scale interventions if farmers are to capitalize on the market opportunities available to them. Below are lessons learned from the PHHS project's work to stimulate investment and lending.

Lesson Learned: *Investments in large storage infrastructure will not address the core problem.*

One of the main lessons that the PHHS project learned was that the conventional wisdom stating that Rwanda needs more large-scale storage infrastructure is not supported by the dynamics of the market. Since Rwanda enjoys two or three harvest seasons per year, the business cycle is very short and seasonal price fluctuations are minimal. Accordingly, the average gain from long-term storage is unlikely to support the cost of constructing and managing those facilities. The only exception to this is the case of strategic reserves, where long-term storage is required and can yield significant benefits in terms of long-term price smoothing and crisis mitigation.

There is, however, an opportunity for cooperatives to deliver larger quantities and capture higher prices through improvement of basic infrastructure and practices related to aggregation, shelling, cleaning, sorting, drying and marketing of surpluses. By providing these services to buyers, cooperatives can capture more value for their members. Specific investment requirements include equipment and infrastructure for shelling, quality/moisture control, cleaning and drying, fumigation, bagging, and delivery, as well as some short-term storage (about 30 – 50MT) while waiting for pickup from a trader or end

buyer. Paired with financing solutions for purchases from members, such investments can yield significant returns.

Implications for Future Programs: While PHHS has done extensive analysis to determine that silos and other large storage facilities do not make economic sense in Rwanda, there is still a widespread notion that the country should invest in this sort of infrastructure. USAID programs can play an important educational role in shifting the focus of key actors like **MINAGRI, banks, cooperatives, and buyers to the sort of small, short term storage (particularly on-farm) and grain merchandizing facilities that the PHHS project has successfully piloted**. Additionally, the pilot merchandizing credit product is only one of many that USAID could support to increase financial intermediation around this business model. Future programs could explore leasing, for example, as an alternative to matching grants for small equipment. The important consideration is that the financial product addresses a real market failure.

Lesson Learned: *Poor comprehension on the part of banks and cooperatives of agricultural lending poses risks*.

While the merchandizing credit product has addressed a real market failure, there are capacity constraints on the part of both banks and cooperatives that pose risks. Cooperatives have defaulted on loans when there were loose parameters set by banks. In the case of the Indakuki cooperative's agreement with KCB, the cooperative sought a loan that supported purchases from their members, as well as procurement of additional maize from the open market. In effect, the larger loan size allowed Indakuki to become a trading company. However, the maize that Indakuki was able to purchase on the open market was lower quality and did not meet WFP standards. As a result of these relaxed loan parameters, the contract was not fulfilled and Indakuki defaulted.

The Indakuki case is illustrative of capacity constraints on both sides. On the cooperative side, capacity to manage risk and maintain a focus on core activities (aggregation and marketing of member grain) led to the request for a loan exceeding their purchase requirements. On the bank side, lack of capacity to manage risk and limit the scale of the loan to the cooperative's production capacity led to the approval of a loan that the cooperative could not realistically manage.

The implied strategy for limiting risk on both sides is to require that financing not exceed the amount of grain that has already been harvested and is in stores (or at least in the fields, about to be harvested). This would take the cooperative out of the trading company role that Indakuki found itself in. Shortening the loan cycle would also limit risk. An optimal period of around 90 days would cover one harvest cycle and loans could be reissued on a rolling basis to cover successive cycles. Shorter cycles also mitigate the risk of price fluctuations. Implementing these risk management mechanisms is a matter of banks, buyers, and cooperatives understanding how to structure a transaction and loan agreement that is best suited to the sector.

While a part of PHHS' training program included a module by a local firm—AFICCO—on cooperative management, leadership, marketing, record keeping, and action planning, the training module did not incorporate training on finance and loan management. In analyzing the default situations further, the project found that the majority of cooperatives demonstrated a lack of understanding of loan terms and agreements (interest rates, repayment conditions, etc.).

Implications for Future Programs: The merchandizing credit product and most any financial product will only be successful if based on a solid understanding of the risks on both the bank and the cooperative side, along with capacity to manage those risks. The lessons learned from the pilot phase of the

merchandizing credit product can inform future capacity building efforts and design of additional products (with related risk management mechanisms) that unlock credit flows to the sector. In order to help build cooperatives' understanding about the appropriate utilization of the grain merchandizing credit product, for example, the PHHS project has developed an additional module that is entirely focused on loan management training and will be delivered to previously trained and new cooperatives. This training will provide extensive information on the importance of working within the grain merchandizing product's parameters, the importance of fulfilling contracts, and the consequences of not doing so.

Lesson Learned: *Structured transactions with reputable buyers are needed to expand lending to the sector.*

Pressure is coming from bank headquarters and the Rwandan government for loan officers to pursue more agricultural lending and investment. This is leading banks in Rwanda to expand traditional credit offerings (mostly collateral-based capital loans) to agricultural cooperatives, which poses risks to both banks and cooperatives. Meanwhile, what cooperatives really need is asset-based working capital to expand their aggregation, quality assurance and marketing services. In this context, lending against fixed assets is like trying to fit a square peg into a round hole.

Developing and adapting more appropriate credit products for agriculture and agribusiness, however, requires that banks are able to see avenues for mitigating their risk. The experience of the PHHS project has been that developing structured transactions between established buyers like WFP provides a platform for banks to comfortably pilot new lending instruments. Without this platform, banks will continue to rely on fixed-asset collateral to mitigate risk.

Implications for Future Programs: As the PHHS project and other market linkages programs expand the role of structured transactions in the agricultural sector, complementary work with banks to develop, pilot and scale appropriate lending instruments should be undertaken. Meanwhile, the PHHS project and other programs may need **to work more closely with the banks to steer them away from traditional, collateral-based long-term loans that pose risks to the sector in the long run.**

4. POST-HARVEST MANAGEMENT

Little post-harvest management infrastructure exists for staple crops, and most farmers lack knowledge of or access to information on appropriate post-harvest handling practices. As a result, under the post-harvest management component, the PHHS project has focused largely on rolling out a comprehensive capacity-building program targeting maize and bean cooperatives in the Eastern and Southern provinces through a Training of Trainer (ToT) model. The training included two major components: 1) training on post-harvest handling and storage techniques; and 2) assessing the effectiveness of the training.

Based on this model, the project launched a joint WFP P4P training program, Sell More for More, to improve cooperatives' capacity to meet WFP requirements. The training program consists of six modules in leadership, marketing, business planning, record-keeping, post-harvest handling and warehouse management. The ToT component, facilitated by "sticks" banners, records the initial trainees' success in training additional cooperative members. An estimated 30,000 farmers were trained through this program.

The project also developed a training curriculum for cooperative leaders that features four modules on leadership, marketing, record keeping, and action planning. Both trainings on post-harvest and cooperative management were rolled out to cooperatives across Rwanda, with a total of 79 cooperatives trained in post-harvest management and 29 cooperatives trained in cooperative management. Based on recent assessments by the project, cooperatives supported with the training and grants for appropriate post-harvest technology were able to reduce their losses from an estimated 35-40% to less than 5%. Additionally, because the training required at least 50% participation by women, significant gender impact was achieved. This is especially important because the vast majority of post harvest activities are managed by women, so they have a significant role in reducing post harvest losses.

Different cooperatives that have participated in trainings together are now working together to share resources including storage infrastructure. The project has also seen improvements in understanding how to write and manage contracts and some cooperatives have started demanding that new contracts be drawn up in Kinyarwanda instead of English. Related to this, cooperatives are reaching out to traders and buyers much more frequently to receive price information before negotiating contracts.

Anchoring the training program in the relationship with WFP served as a catalyst for adoption of practices introduced during the training. As cooperatives improve their capacity to meet the requirements of more sophisticated buyers, this gives them negotiating power and allows for diversification beyond the initial anchor buyer. The project has supported this diversification, with cooperatives initially supplying WFP moving on to supply commercial buyers. The powerful combination of well-designed training and a sustainable market linkage made this possible.

Lesson Learned: *Training in post-harvest handling needs to be paired with necessary post-harvest equipment.*

The main lesson learned that PHHS learned from its Post Harvest Management module was that while the training program was very effective for some of the trainees, among cooperatives that do not have access to post harvest equipment, benefits of the training have not been fully realized. The training was much more effective among cooperative members who had access to the post-harvest equipment and technology that they were being trained to use, which was estimated at around 35% of those trained. Cooperatives that have access to plastic sheets for drying maize, bags, and shellers have brought post harvest losses down to less than 5%. Cooperatives that do not have access to this equipment have been

able to reduce their losses, as well, but not nearly to the same degree as those cooperatives that do have the equipment.

Implications for Future Programs: This lesson learned, while perhaps obvious, should empower future programs supporting cooperatives to encourage utilization of post-harvest equipment on the basis of real evidence of return on investment. The findings also support the notion that integrated projects involving both training and financial facilitation (reinforced by market linkages) are most likely to be successful in achieving meaningful reductions in post-harvest losses. Any one component individually would likely gain minimal traction.

Where the PHHS project has not intervened is in the area of supporting the expansion and marketing efforts of agro-dealers and equipment suppliers. The findings from the PHHS training program could reinforce and justify further investment by donors in developing the market for plastic sheets, bags, and shellers, in particular.

Lesson Learned: *Working with a local service provider improves the quality and long-term availability of trainings*.

Feedback from the Sell More for More program points to the success of using a local service provider to implement trainings. Currently, Rwanda has two local service providers that are capable of implementing post-harvest management and cooperative management trainings without the technical guidance of an international contractor. The local service providers, WEACS and AFFICO, have also been successful in developing the training approach and strategy so that international best practice is married with local practice and context.

This provides a solid foundation for a future service industry supporting agribusiness, but that industry is not yet commercially viable. Competition from donor and government-subsidized programs supporting agriculture is such that cooperatives and agro-processors aiming to improve supply chain efficiencies do not generally need to procure these services from commercial providers.

Implications for Future Programs: Now that the PHHS project has developed and proven the capacity of local service providers through its training component, it is critical that the broader donor community and government of Rwanda continue to support this industry as subsidized trainings are pulled back. Transition from a donor-funded model to a fee-for-service approach will require further capacity building of the local service providers and a careful phase-out of subsidies that gradually accustoms agro-enterprises and cooperatives to procuring consulting services. Recently, WEACS was hired by another USAID project implemented by CHF International to roll-out similar trainings. This model is in line with USAID Forward principles and allows for increased supply and competition of trainers and BDS providers in Rwanda.

Lesson Learned: *The ToT model is a successful tool for reaching a large number of farmers with limited resources*.

Initially, the PHHS project focused its training efforts on district agronomists employed by the Ministry of Agriculture. After evaluating the extent and quality of onward training of farmers and cooperatives, the project changed directions to focus on a lead farmer ToT model. The former approach had simply not achieved the reach that the project sought.

The ToT model proved successful in training cooperatives with large memberships as well as reaching non-member, neighboring farmers. The number of lead trainers selected from each cooperative was dependent on that cooperative's membership, so that a certain percentage of a cooperative would be trained no matter the size (a 1 to 30 ratio). Additionally, it was noted that lead trainers also trained farmers outside the cooperative, therefore producing a spill-over effect which has allowed for imitation and adoption by non-members.

The project's cooperative management training was not developed as a ToT and only trained a fixed number (15) of members per cooperative. This model proved to be more ineffective due to the small number of trainees reached, and the high turnover rate of cooperative leaders.

Implications for Future Programs: The lead farmer ToT model allows trainings to be delivered in a more cost-effective way since information is disseminated down through trainees and the STICKS model. Additionally, the ToT model allows lead trainers to become skilled at post-harvest management or cooperative practices in order to be available to provide ongoing guidance to fellow cooperative members and those who may not be cooperative members but are producing in their communities.

The imperative for future programs is to chart a path to sustainability of farmer training in post-harvest management. The lead farmer ToT model is a template that can be applied in the context of different business models. For example, the Ministry of Agriculture could elect to procure the services of local providers whose capacity was built under the project to continue the ToTs as part of the government's overall support to the agricultural sector. Alternatively, as the private agro-dealer sector expands, aspects of the ToT could be integrated into agro-dealer customer service and marketing programs. These are two models that could be explored, but there are surely others. Some planning by donors, government agencies and private sector associations supporting the agricultural sector is necessary to ensure continuity of this important program.

5. POST-HARVEST POLICY

During FY2010, USAID engaged the PHHS project to assist Rwanda's Ministry of Agriculture (MINAGRI) in developing a National Post-Harvest Staple Crop Policy to address issues related to excess production, including post-harvest losses due to poor handling, and lack of storage and processing infrastructure. Under this component, the PHHS project finalized a report and action plan providing evidence-based examples, policy guidelines and suggestions for interventions by MINAGRI in order to encourage private sector driven approaches to addressing post-harvest losses. Specific recommendations included improving efficiency of transport systems between production and secondary aggregation points, and leveraging the Rwanda Strategic Grain Reserve's buying power to support marginal, but viable markets that will benefit from road improvements.

The PHHS team then assisted MINAGRI to develop a strategy to address the development of a strong Rwandan post-harvest sector and complement GORs plans for a strategic grain reserve system. The strategy was approved and formally passed by Cabinet in December 2011. It should be noted that due to the large number of policy papers and the complexity and difficulty of getting them accepted by Rwandan Government, very few policy papers are actually passed. This relatively swift passage should be seen as a success, but only an initial step toward a comprehensive approach by the government to developing the post-harvest sector.

The PHHS project also supported the Ministry of Agriculture in developing its policy planning capacity, shifting to a more accurate approach for assessing what future surpluses will be and how the government can respond in ways that maximize the volume of surpluses reaching the market. The Ministry of Agriculture-led Post Harvest Task Force is the central mechanism for inter-agency planning, with individual agencies and Ministries responsible for different aspects of strategy implementation. One challenge that has emerged in the implementation process is the PHHS project's limited ability to work across agencies of the government that see themselves as having competing or overlapping mandates. While the project has still been doing so, ownership within the government of PHHS oversight by MINAGRI limits the extent of this support.

Lesson Learned: *Policy development and implementation should be data-driven.*

Good data and quantitative information is critical for designing effective government strategies. Under the PHHS project, some investment in developing quality data on post-harvest losses would likely have facilitated a more rapid and informed design process for the policy strategy. This would also have allowed for more robust monitoring of the effectiveness of policy implementation as that proceeds. Both data collection and the development of a policy framework for the strengthening of post-harvest systems would ideally have come first and informed overall PHHS project design. This would have made the process of transitioning PHHS activities to local institutions easier and may also have resulted in more co-investment by the Government of Rwanda in PHHS activities.

To address the lack of baseline data, the PHHS project supported the Government of Rwanda in developing a monitoring system for national post harvest losses. The project conducted a nationwide assessment on maize and rice, which found that while conventional wisdom placed post-harvest loss figures at ~40%, actual post harvest losses were closer 20-25%. Additionally, the assessment allowed the project and the government to see which areas are suffering from the highest post-harvest losses in comparison to the rest of the country so that it is possible to target priority areas for intervention. The

project also designed and instituted a system for MINAGRI and trained their staff members on how to utilize it for future data collection and analysis.

Implications for Future Programs: As USAID and other donors design future programs, the post-harvest monitoring system developed by the project serves as a valuable reference point for design and prioritization of activities that are likely to have the greatest impact on post-harvest losses. The policy framework articulated in the post-harvest strategy should also inform these programs. The PHHS project itself would have benefitted from this sort of data and policy framework before launching into direct technical assistance and grant activities.

Lesson Learned: *Building ministry capacity requires dedicated project staff who bring credibility to the process.*

The PHHS project coordinated policy activities through a full-time Policy Advisor. By having a full-time policy expert with knowledge of policy reform and credibility within the Rwandan government, the project was able to have a strong voice in the strategy process. The PHHS Policy Advisor was viewed as an "expert," and therefore, the project's guidance and assistance was heard and often accepted. Although the majority of the Policy Advisor's job was to attend meetings with the ministries involved in the post-harvest strategy and directly consult and coordinate with the Prime Minister, MINAGRI and other government ministries, these proved to be critical to developing a coherent framework for the coordination of post-harvest initiatives across government agencies and donor projects.

Implications for Future Programs: It is recommended that for policy or government-level activities, USAID projects hire and engage a full-time employee with credibility within the government; this could either be an expat with significant outside technical knowledge, or a local Rwandan that also brings both knowledge and connections within the government. USAID should be prepared to put significant resources into activities related to relationship-building, meetings and consultations, but also expect to see the returns on this investment in the form of more efficient targeting of activities across agencies leading to increased impact.

Lesson Learned: *Projects should be structured to work across ministries in order to achieve greatest impact.*

At the Government of Rwanda level, the PHHS project was managed by MINAGRI. As the donor coordination point for activities in the agricultural sector, there is some sense in this. Since the scope of the project and the complexity of the post-harvest system spans the mandate of multiple Ministries, however, this has also generated challenges.

Implications for Future Programs: To the extent that future programs similar to PHHS in complexity can be designed to work with and report to multiple Ministries, this would provide greater operational flexibility and ultimately lead to deeper impact.